

# Hemorrhage From Abdominal Non-Hodgkin's Lymphoma Treated Successfully by Emergency Transcatheter Arterial Embolization

Junji Suzumiya, Mitsuyuki Nagano, Hideyuki Higashihara, Tetsuya Yoshida, Motoi Hirano, Yoshinori Go, Eiji Morioka, Nobuhiro Kimura, Shusuke Hisano, Masatoshi Okazaki, Masahiro Kikuchi, and Makoto Okumura

First Department of Internal Medicine, (J.S., M.N., T.Y., M.H., E.M., N.K., S.H., M. Oku.), Department of Radiology (H.H., M. Oka.), and First Department of Pathology (J.S., Y.G., M.K.), School of Medicine, Fukuoka University, Fukuoka, Japan

A 49-year-old Japanese woman with follicular lymphoma who presented with severe abdominal and back pain is reported. She was known to have malignant lymphoma and had been previously treated with combination chemotherapy. An abdominal tumor occurring at the root of the mesentery and involving the superior mesenteric artery (SMA) had been diagnosed by computed tomography (CT), magnetic resonance imaging, and abdominal angiography. Emergent ultrasonography and CT findings showed intraperitoneal bleeding from the abdominal tumor. Selective SMA angiography revealed extravasation from a small branch originating from the dorsal pancreatic artery, which was embolized through a catheter by using platinum coils. It should be noted that a large tumor of malignant lymphoma, involving large vessels, may bleed, and in such a case selective transcatheter arterial embolization may be one of the effective modalities for hemostasis.

© 1996 Wiley-Liss, Inc.

**Key words:** non-Hodgkin's lymphoma, hemorrhage, embolization

## INTRODUCTION

A hemorrhage which develops in a malignant tumor may cause extremely serious complications. A hemorrhage caused by a pathologic rupture of a malignant tumor, such as in hepatocellular carcinoma, is occasionally encountered. However, such a complication in an abdominal tumor, associated with abdominal bleeding, is usually associated with thrombocytopenia or some other coagulopathy [1]. In patients with malignant lymphoma, a splenic rupture has been reported, although this is rare in patients with splenic lymphoma [2,3]. There have been no previous reports of a spontaneous hemorrhage from abdominal malignant lymphoma. Here, we report on such a patient, who was successfully treated with transarterial embolization (TAE).

## CASE REPORT

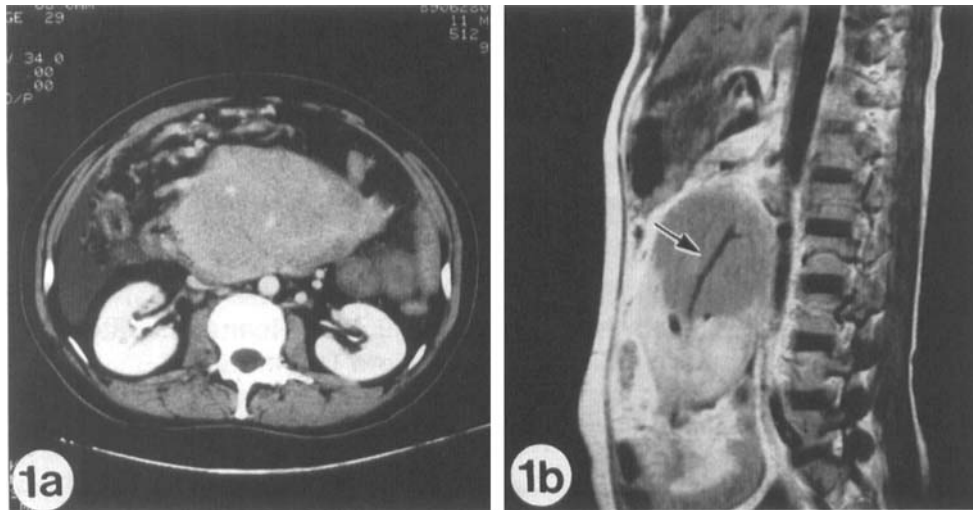
A 49-year-old Japanese woman presented to another hospital, complaining of abdominal fullness in March, 1991. She was found to have ascites, for which she was

examined by computed tomography (CT), magnetic resonance imaging (MRI) (Fig. 1), ultrasonography (US), and angiography. The findings demonstrated a 15-cm abdominal tumor occurring at the root of the mesentery and additionally involving the superior mesenteric artery (SMA). A resection of the tumor by laparotomy was attempted, but proved not to be possible because of its adherence to the wall of the SMA and superior mesenteric vein (SMV). Only a biopsy could be performed, which was compatible with the findings of malignant lymphoma. She thereafter received two courses of cyclophosphamide, adriamycin, vincristine, and prednisolone (CHOP). The

Received for publication August 28, 1995; accepted January 17, 1996.

A part of this study was presented at the 35th Annual Meeting of the Japanese Society of Clinical Hematology, Hiroshima, on November 12, 1993.

Address reprint requests to Dr. Junji Suzumiya, First Department of Internal Medicine, School of Medicine, Fukuoka University, 7-45-1 Nanakuma, Jonan-ku, Fukuoka 814-01, Japan.



**Fig. 1. Abdominal CT (a) and MRI (b). An abdominal large tumor occurring at the root of the mesentery and involving the SMA (arrow) was present.**

tumor decreased in size to approximately 10 cm in diameter as the ascites disappeared.

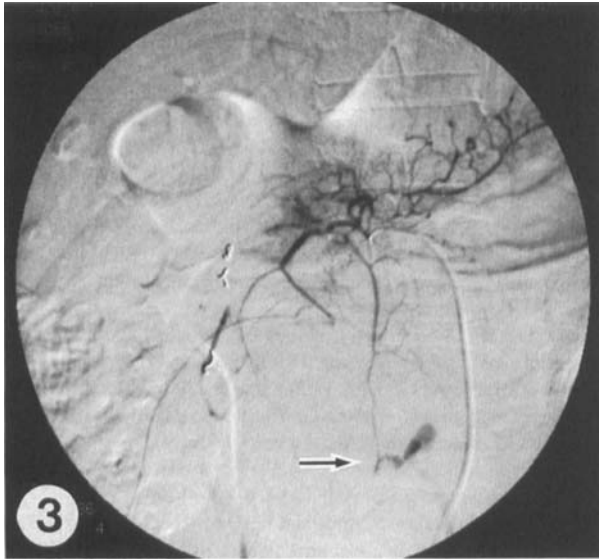
The patient was then referred to our hospital in August 1991 for further treatment. After two courses of a full dose of chemotherapy in our hospital, she was discharged. She continued to receive a half-dose of the same combination chemotherapy as an outpatient, but the tumor gradually increased in size to approximately 14 cm in diameter. She last received a half-dose of CHOP therapy on May 8, 1992. On June 6, she presented to the emergency room of our hospital with acute severe abdominal cramping and back pain. Her blood pressure was 138/80 mmHg, pulse was 80/min and regular, and temperature was 35.6°C. She was alert but appeared to be acutely ill and diaphoretic, and had cold extremities. Severe periumbilical tenderness with guarding was noted. Her superficial lymph nodes were not palpable. Hematocrit was 36.4%, Hb concentration 13.5 g/dl, WBC count 5,400/ $\mu$ l, and platelet count  $24.6 \times 10^4$ / $\mu$ l. Two hr later, Hb decreased to 10.2 g/dl, while serum lactate dehydrogenase (LDH) increased to 507 IU/l (normal range, 200–400 IU/l). LDH value had been 448 IU/l on May 8. Abdominal US suggested an intraperitoneal hemorrhage. Ultrasound-guided paracentesis was performed for the examination, and revealed bloody ascites with a hematocrit of 20.7%. Abdominal CT showed fluids in the intraperitoneal region (Fig. 2). These findings suggested a hemorrhage from the abdominal tumor. The patient became hypotensive. Despite a transfusion of 10 units of concentrated red blood cells, her Hb levels and blood pressure remained low. Selective SMA angiography with digital subtraction showed extravasation from a small branch originating from the dorsal pancreatic artery (Fig. 3). In order to embolize this abnormal vessel, a 2.2-French Tracker co-



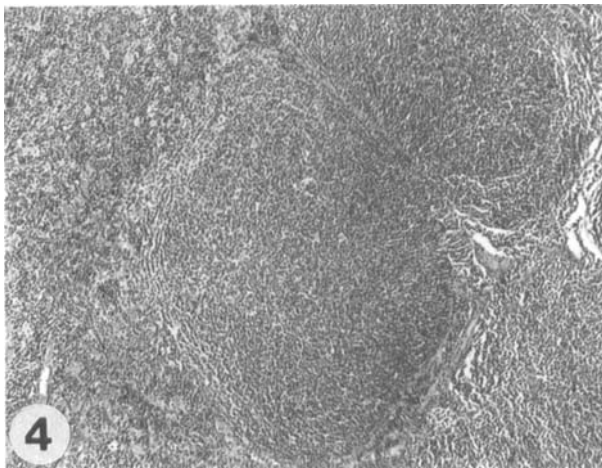
**Fig. 2. Abdominal CT at time of tumor rupture. Fluid collection in the abdominal cavity was noted. Lateral intraperitoneal collection of blood (arrowheads) was present.**

axial catheter and a Taper 0.016" (0.406-mm) platinum-tipped steerable guide wire (Target Therapeutics, Mountain View, CA) were introduced through a 5-French catheter. Embolization was performed by the use of Hilal embolization microcoils (Cook, Inc., Bloomington, IN) through a catheter, resulting in a cessation of the hemorrhage. On June 12, serum total bilirubin rose slightly, to 1.2 mg/dl. The patient then received irradiation (51 Gy) from June 23–July 31, and the tumor decreased in size. The anemia and other abnormal laboratory values also improved. She was discharged on August 4, 1992.

In November 1992, her axillary lymph nodes were found to be enlarged. A biopsy of these nodes showed follicular, mixed, and small- and large-cell type (Working



**Fig. 3.** Superselective dorsal pancreatic arteriography. Extravasation from a small branch originating from the dorsal pancreatic artery (arrow) was revealed.



**Fig. 4.** Biopsy of axillary lymph node. Follicular, mixed, small cleaved, and large cells are shown (H&E).

Formulation classification [4]) (Fig. 4). A chromosomal analysis showed t(14;18)(q32;q21) with del(7)(q22). An immunohistochemical study revealed that the tumor cells were positive for CD 19, 20, IgM, and kappa chain, but negative for CD 1, 2, 3, 4, 8, 15, 16, 25, 30, IgG, IgA, IgD, lambda chain, and HLA-DR. At this point, the previous biopsy obtained at laparotomy was reviewed, and a diagnosis of follicular lymphoma was made. The patient received one course of cyclophosphamide, pirarubidin, vindesine, and prednisolone, and then underwent an autologous bone marrow transplant with a conditioning regimen consisting of 700 mg ranimustin (MCNU) for 4

days, 500 mg carboplatin (CBDCA) for 4 days, 1,000 mg etoposide (VP-16) for 3 days, and 3,000 mg cyclophosphamide for 2 days in January, 1993. As of April 1995, she is doing well and is in complete remission.

## DISCUSSION

It is well-known that a spontaneous tumor rupture may occur in hepatocellular carcinoma [5,6], sarcoma [1], and adenomyolipoma [7]. In patients with malignant lymphoma, a hemorrhage from a tumor has been reported in cases of splenic [2,3] or gastrointestinal [8] lymphoma. However, a spontaneous hemorrhage in abdominal malignant lymphoma has only very rarely been observed. There are several possible reasons for such a spontaneous hemorrhage from the tumor in our patient. One possibility would be involvement of the SMA and SMV. The fragile walls of these vessels were probably invaded by lymphoma cells. A second possibility would be a tumor rupture induced by complications such as trauma. Abdominal malignant lymphoma involves an ordinary hypovascular tumor, compared with tumors of sarcoma, including leiomyosarcoma, malignant fibrous histiocytoma, and fibrosarcoma. However, the patient had no history of trauma. It was thus difficult to assume that the hemorrhage from the abdominal lymphoma was induced by trauma. A third possibility would be the effect of chemotherapy. However, 1 month later, the rupture of the tumor occurred from the last chemotherapy. Therefore, the chemotherapy may not have been the direct cause of the tumor rupture, although a secondary effect of chemotherapy cannot be denied. At the time of hemorrhage, we considered that the abdominal tumor was not a malignant lymphoma, but some other malignant tumors such as malignant fibrous histiocytoma. Based on our experience with this patient, we find that a spontaneous hemorrhage may occur in patients with malignant lymphoma, when the tumor involves the large vessels. Malignant lymphoma should thus be included in the differential diagnosis when a patient with a hemorrhage from a tumor is encountered.

Hemorrhage from a tumor can be a fatal complication [6]. Angiography plays a well-established role in both diagnosis and subsequent management of arterial hemorrhage. Embolization, a nonsurgical procedure, has been successfully used in various organs to control arterial bleeding of different origins, and it is less invasive than surgical intervention [6,9,10]. Embolization with a micro-coil under superselective catheterization, using a coaxial system, is therefore considered to be the first treatment of choice for hemorrhage from small-caliber branches of the splanchnic artery [11–13]. This type of embolization was selected as the preferred treatment for our patients, who was considered an extremely high-risk candidate for emergent surgical control of bleeding because of shock and underlying severe disease. This type of embolization

proved successful in treating the life-threatening hemorrhage caused by a rupture of a malignant lymphoma. We conclude that selective catheterization of the small arteries is a valuable technique for conducting embolization therapy in such hemorrhage cases.

## ACKNOWLEDGMENTS

This work was supported in part by a Grant-in-Aid from the Fukuoka Cancer Society and a Grant-in-Aid for General Scientific Research from Ministry of Education, Science, and Culture, Japan. We thank Dr. K. Tamura, Chief of the Department of Internal Medicine, Miyazaki Prefectural Hospital, for his valuable suggestions, Ms. A. Ohgami for her excellent technical assistance in the chromosomal analysis, and Mr. H. Nishimura for his skillful photographic technical assistance.

## REFERENCES

1. Dutcher JP: Hematologic complications of malignancy. In Moossa AR, Robson MC, Schimpff SC (eds): "Comprehensive Textbook of Oncology." Baltimore: Williams & Wilkins, 1986.
2. Andrews DF, Hernandez R, Grafton W, Williams DM: Pathologic rupture of the spleen in non-Hodgkin's lymphoma. *Arch Intern Med* 140:119-120, 1980.
3. Bauer TW, Haskins GE, Armitage JO: Splenic rupture in patients with hematologic malignancies. *Cancer* 48:2729-2733, 1981.
4. The Non-Hodgkin's Lymphoma Pathologic Classification Project. National Cancer Institute sponsored study of classifications of non-Hodgkin's lymphomas: Summary and description of a Working Formulation of clinical usage. *Cancer* 49:2112-2135, 1982.
5. Natelson EA, Allen TW, Riggs S, Fred HL: Bloody ascites: Diagnosis implications. *Am J Gastroenterol* 52:523-527, 1969.
6. Okazaki M, Higashihara H, Koganemaru F, Nakamura T, Kitsaki H, Hoashi T, Makuuchi M: Intraperitoneal hemorrhage from hepatocellular carcinoma: Emergency chemoembolization or embolization. *Radiology* 180:647-651, 1991.
7. Oesterling JE, Fishman EK, Goldman SM, Marshall FF: The management of renal angiomyolipoma. *J Urol* 135:1121-1124, 1986.
8. Ehrlich AN, Stalder G, Geller W, Sherlock P: Gastrointestinal manifestations of malignant lymphoma. *Gastroenterology* 54:1115-1121, 1968.
9. Okazaki M, Higashihara H, Koganemaru F, Ono H, Hoashi T, Kimura T: A coaxial catheter and steerable guidewire used to embolize branches of the splanchnic arteries. *AJR* 155:405-406, 1990.
10. Goldstein HM, Wallace S, Anderson JH, Bree RL, Gianturco C: Transcatheter occlusion of abdominal tumors. *Radiology* 154:539-545, 1976.
11. Okazaki M, Higashihara H, Yamasaki S, Akita Y, Toriya H, Shirai Z: Arterial embolization to control life-threatening hemorrhage from a Meckel's diverticulum. *AJR* 154:1257-1258, 1990.
12. Okazaki M, Higashihara H, Koganemaru F, Ono H, Fajimata R, Yamasaki S, Toyoshima H, Sato S, Hoashi T, Kimura T: Emergent embolization for control of massive hemorrhage from a splanchnic artery with a new coaxial catheter system. *Acta Radiol* 33:57-62, 1992.
13. Okazaki M, Higashihara H, Ono H, Koganemaru F, Hoashi T, Inada S, Kuroda I: Percutaneous embolization of ruptured splanchnic artery pseudoaneurysms. *Acta Radiol* 32:349-354, 1991.